Men of astronomy

Revolutionaries of the Cosmos: The Astro-Physicists
by Ian Glass
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As a youth, Ian Glass was inspired by Eric Temple Bell's book *Men of Mathematics* (Simon & Schuster, 1937), which profiled more than 30 mathematicians. In *Revolutionaries of the Cosmos*, Glass has attempted to do much the same for astronomy. He has restricted himself to just eight subjects, and has clearly been careful in his biographical research, which he documents in detail after each chapter. There are about 30 or 40 pages per individual, which is an admirable length, as one often wants more than a brief dictionary entry but less than a full-scale biography.

The selection of individuals —Galileo, Isaac Newton, William Herschel, William Huggins, George Ellery Hale, Arthur Eddington, Harlow Shapley and Edwin Hubble — may raise a few eyebrows. Glass chose them because each "made at least one important discovery by applying the methods of physical science to astronomy" — hence the reference in the subtitle to 'astro-physicists', with the hyphen emphasizing the historical development. Even so, the methods of physical science changed considerably over the centuries and it seems somewhat unbalanced that a book called *Revolutionaries of the Cosmos* contains only passing mentions of Tycho Brahe and Johannes Kepler, yet Huggins receives the full treatment in recognition of his spectroscopic achievements. And it seems that Herschel, despite his telescopic discoveries, believed for most of his life that the Sun and Moon were inhabited by living creatures. That all these people, with the exception of Galileo, came from the English-speaking world means that the book is not a balanced history of astronomy, but that obviously was not the author's intent. Researchers from non-English-speaking nations often enter the story in passing, however, providing some balance.

Glass writes clearly, interestingly and even-handedly throughout. His opening chapters cover material that will be familiar to most readers, but he brings out details that many might be unaware of, such as the fact that Galileo received considerable support from the more progressive church officials in his confrontation with the Catholic Church. And that while Galileo held the mathematics chair at Padua University, an official mooted an increase in salary for him because he had acquired a mistress.

But it is the later chapters, mainly covering the twentieth century, that will appeal to most readers, especially those who have at least a casual knowledge of astronomical history in this period. The story of Hale is particularly absorbing: he founded two of the world's most important observatories, as well as the California Institute of Technology, and set up some of the world's largest telescopes, yet he battled mental-health problems for much of his life.

The Hale telescope, dedicated in 1948, commemorates one of the founders of modern astrophysics.

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The chapter on Eddington is similarly fascinating. He was attacked by other British scientists around the time of the First World War because, as a Quaker, he argued that most German scientists were not the monsters they were made out to be. His pacifist views nearly led to his imprisonment by the British government. Glass also discusses Eddington's interactions with his rival, James Jeans. Their violent arguments over each other's papers presented at meetings of the Royal Astronomical Society were so intense that some people, such as G. H. Hardy, joined the society just to have a ringside seat! Yet it was a common sight to see Eddington and Jeans enjoying afternoon tea together.

Glass's writing includes quiet touches of humour here and there. For example, he tells us that early prospective authors writing for *The Astrophysical Journal* had to face its three editors: Hale, Gale and Frost. And that the budget for building the world's finest spectroheliograph in 1899 was so small that one of the lenses had to be bought from a pawnbroker.

Although Glass doesn't comment on it, his book does implicitly raise the question of whether or not the future will be very different. One has only to look at *The Astrophysical Journal* now to realize that the day of the lone researcher is over: large teams are the order of the day, and it's doubtful whether individuals will ever be as influential as they used to be. Meanwhile, Glass has written an absorbing book, which I strongly recommend. ■

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The puzzle of cooperation

Moral Sentiments and Material Interests: The Foundations of Cooperation in Economic Life
edited by Herbert Gintis, Samuel Bowles, Robert Boyd & Ernst Fehr
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Andrew M. Colman

Robert May began his last presidential address to the Royal Society on 30 November 2005 by saying: "The most important unanswered question in evolutionary biology, and more generally in the social sciences, is how cooperative behaviour evolved and can be maintained in human or other animal groups and societies". For example, birds often emit alarm calls when they spot predators, but how could such behaviour have evolved? A mutant bird that never gave alarm calls would save energy and avoid the additional risk to itself while enjoying the benefits of its conspecifics' alarm calls. Its 'selfish gene' should therefore spread to fixation in the population.

For the same reason, cooperation is difficult to maintain when individuals are tempted to defect. A recent human example in Britain is the decline in voluntary take-up of the combined measles–mumps–rubella (MMR) vaccination by parents who wished to avoid an alleged health risk to their own children while